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# REPORT ON RAIL AND MARINE INTERFACE AT THE PORT OF BALTIMORE



U.S.  
DEPARTMENT  
OF  
COMMERCE

Maritime  
Administration



# **REPORT ON RAIL AND MARINE INTERFACE AT THE PORT OF BALTIMORE**



**NOVEMBER 1973**

**U.S. DEPARTMENT OF COMMERCE  
Frederick B. Dent, Secretary**

**MARITIME ADMINISTRATION  
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**Prepared by  
Ports and Intermodal Systems Office  
Maritime Administration Eastern Region**

## FOREWORD

The Maritime Administration, through the programs of the Office of Ports and Intermodal Systems, is fostering the continued growth of intermodalism and the American Merchant Marine. It is recognized that the interface of marine terminal operations with those of the rail carriers is a key to improving the effectiveness of the intermodal system. Reducing the cost, time, and distance factors involved in the interface between U.S. flag carriers and inland modes can contribute to the efficiency and economy of intermodal transport, and thereby further enhance the competitiveness of the American Merchant Marine.

In March of 1973, the Maritime Administration, Eastern Region, Ports and Intermodal Systems Office, prepared a report concerning the rail/marine interchange of marine containers at the Port of New York. It was thought that this problem was serious enough to warrant extensive and timely analysis, complimented by suggested recommendations for improvement. Industry reaction received by Washington and the Eastern Region Office has been most favorable, and in that light, similar studies of other ports have been undertaken. It is hoped that these reports will shed helpful light on the nature, procedures, and problems of container interchange, and will contribute towards the eventual refinement of this operational interface.

The Office of Ports and Intermodal Systems and the Eastern Region Office welcome inquiries regarding these reports and other ongoing efforts of the Maritime Administration in the field of commercial development and the promotion of the American Merchant Marine.

## TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>
Introduction	1
Summary	2
Baltimore Harbor Chart	3
Rail Terminal Survey	4
Penn Central Railroad	4
Chessie System	4
Western Maryland Railway	5
Marine Terminal Survey	6
Dundalk Marine Terminal	6
Terminal Chart	7
Canton Marine Terminal	8
Terminal Chart	9
Sea Girt Terminal	10
Terminal Chart	10
Locust Point Marine Terminal	11
Terminal Chart	12
Analysis of Rail/Marine Interface	13
Drayage Distance/Time Tables	14
Recommendations	16



## INTRODUCTION

This survey and analysis is one of a series of reports examining the rail terminal/marine terminal interchange of intermodal equipment at major east coast ports. The survey concentrates on U.S. flag steamship operators, but this cross section amply represents normal port interchange procedures.

The Port of Baltimore is located on the Patapsco River, near the head of Chesapeake Bay, and represents the largest single economic asset of the State of Maryland. Normal access to the port is via the Virginia Capes, 150 miles to the south at the mouth of Chesapeake Bay. An optional northern access route via Delaware Bay and the Chesapeake and Delaware Canal is also available. The development of Baltimore as a major east coast seaport is due to numerous favorable commerce factors, not the least of which is its geographical location many miles nearer major inland industrial centers than other competitive east coast seaports. Resultant quicker highway and rail service and cheaper transportation costs have been of great advantage, complementing forward looking port planning and development in general.

Approximately one third of all export/import containers moving through the port do so by rail. Three major railroads, the Chessie System, the Penn Central, and the Western Maryland, service the port. They are supplemented by the Canton Railroad, which acts as a terminal carrier for the waterfront section of East Baltimore and provides direct switching services to many local marine terminal areas. Rail terminals exist at several portwide locations, including some marine terminals which are active in port container interchange operations.

All U.S. flag liner companies operating on the east coast serve the Port of Baltimore. These companies utilize four different marine terminals, and offer container service to one degree or another to the shipping public using the port.

## SUMMARY

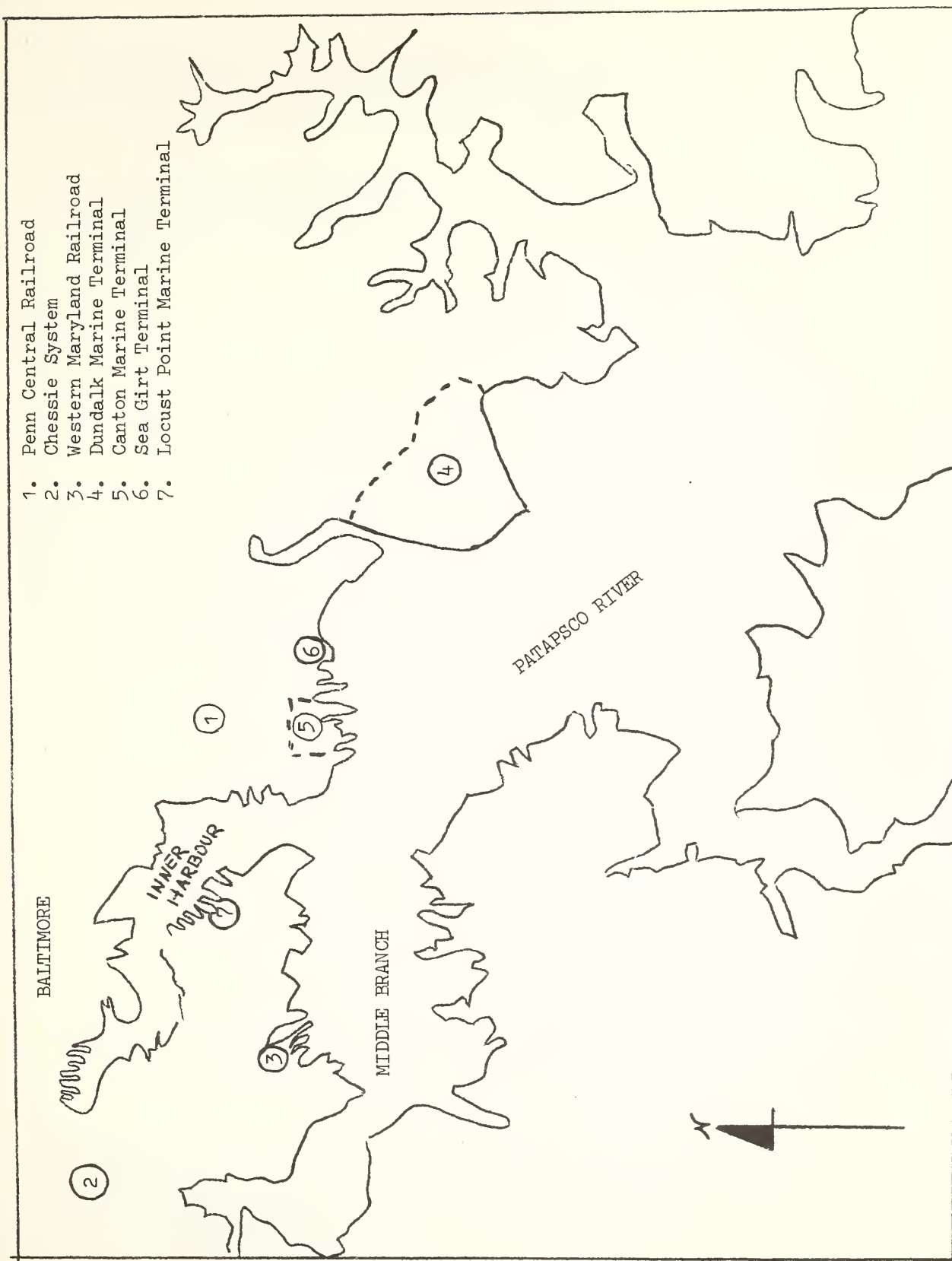
The rail terminal/marine terminal interchange of containers in Baltimore is performed either by motor carrier between the rail and marine terminals or by direct rail delivery to the marine container terminals by the railroads.

The congestion and delay levels are low and operationally acceptable. The relative lack of congestion is due to the following reasons:

1. The total container volume moving through the port presently is substantially less than the port's maximum volume capability.
2. The normal drayage patterns, though existing in urban areas, are not hindered severely by motor traffic bottlenecks, thereby allowing efficient transit times.
3. The various terminals handling containers are not in one concentrated area and container traffic is therefore dispersed.
4. General marine terminal efficiency has eliminated queuing and long delays for motor trucks picking up and delivering containers.

The present level of port and terminal development taking place is more than adequate to insure the efficient handling of projected container growth in the foreseeable future.

1. Penn Central Railroad
2. Chessie System
3. Western Maryland Railroad
4. Dundalk Marine Terminal
5. Canton Marine Terminal
6. Sea Girt Terminal
7. Locust Point Marine Terminal



BALTIMORE HARBOR

## RAIL TERMINAL SURVEY

The rail terminal survey includes descriptions of the respective rail terminals of the three trunk line railroads serving the Port of Baltimore. Services, practices, and facilities of each are covered as they relate to marine container piggyback operations.

Methods of handling piggyback traffic vary, depending on whether the operation is container on flat car (COFC) or trailer on flat car (TOFC). Most piggyback traffic is domestic commerce with ten to twenty percent representing export/import traffic.

### PENN CENTRAL RAILROAD

Bayview Yard, located in East Baltimore, is the primary rail terminal for the Penn Central within the port area. A major function of this terminal revolves around piggyback operations, both domestic and export/import.

Trackage is available from Bayview to all marine terminals within the port through switching via connecting carriers at published tariff charges. Penn Central maintains direct trackage onto Dundalk Marine Terminal, the largest and most modern facility in the entire port. Dundalk is a ramp point for all marine container traffic handled by the Penn Central. In addition, Sea Girt Terminal and Canton Marine Terminal also have been declared ramp points. This requires Penn Central to accomplish transfer by either drayage or switching piggyback railcars onto these terminals via other rail carriers.

### CHESSIE SYSTEM

The piggyback terminal of the Chessie System is located in the downtown area just west of the Inner Harbor, and is known as the Wicomico Street ramp. The Chessie System has also designated the following marine terminals as ramp points:

1. Dundalk Marine Terminal
2. Canton Marine Terminal
3. Sea Girt Terminal
4. Locust Point Marine Terminal

Both drayage and direct marine terminal transfer are utilized as methods of accomplishing the rail/marine interchange of containers. Contracts with five or six local truckers are maintained to satisfy drayage requirements. Rates are established on a per container load basis.

Direct marine terminal transfer requires the switching of railcars onto or adjacent to marine terminals via connecting rail carriers which maintain direct rail trackage to those terminals. The rail carrier initiating the switching movement incurs a \$25 per railcar charge for this service.

## WESTERN MARYLAND RAILWAY

Although operated as a separate entity, Western Maryland Railway is owned and controlled by the Chessie System. The company's main rail terminal in Baltimore for all operations, including piggyback, is at Port Covington, which is also a major marine terminal in the port.

Unlike the Penn Central and the Chessie System, Western Maryland has not restricted its designation of ramp points to a relatively few high volume marine terminals. All marine terminals within the port have been designated as such, and all switching or drayage charges are absorbed by Western Maryland.

The loading and discharging of piggyback railcars at Port Covington is accomplished by a diesel-electric Side Porter.

## MARINE TERMINAL SURVEY

Baltimore is a major port of call for ships engaged in container and trailer traffic. Of the eight U.S. flag operators calling at the port, half utilize Dundalk Marine Terminal, while the other half is divided among three other marine terminals. The breakdown is as follows:

- A. Dundalk Marine Terminal
  - 1. American Export Lines
  - 2. American President Lines
  - 3. Moore-McCormack Lines
  - 4. United States Lines
- B. Canton Marine Terminal
  - 1. Prudential Grace Lines
  - 2. Transamerican Trailer Transport
- C. Sea Girt
  - 1. Sea-Land
- D. Locust Point Marine Terminal
  - 1. Farrell Lines

A brief description of the facilities and general operation of each marine terminal follows.

### DUNDALK MARINE TERMINAL

Dundalk Marine Terminal (DMT) is the largest and most modern marine terminal in Baltimore, and is a major east coast shipping terminal complex. Situated on the Lower Patapsco River on relatively open water, its location away from the inner harbor makes it readily accessible to vessels entering port.

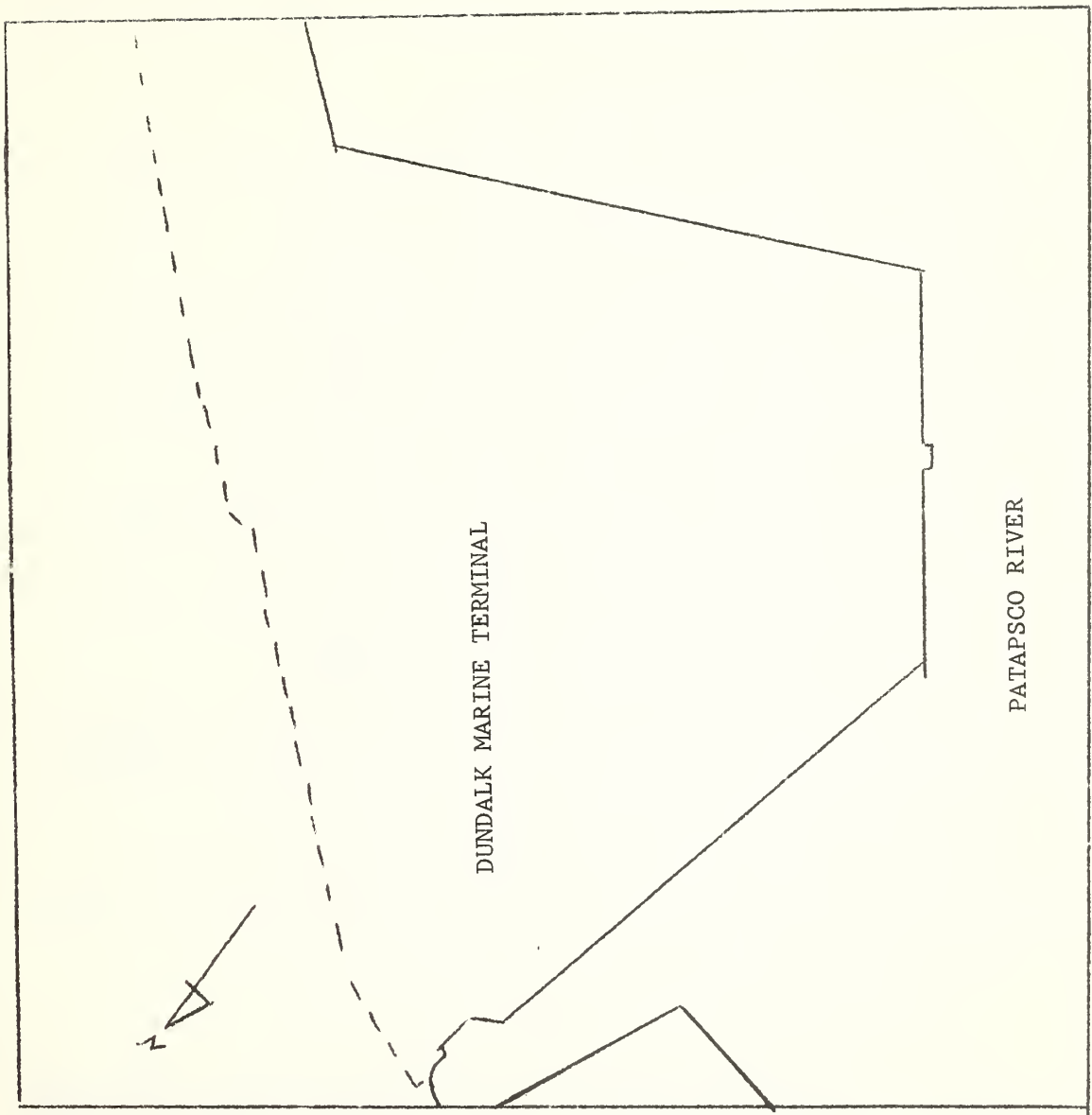
Dundalk is a public marine terminal, owned and operated by the Maryland Port Administration. Predominantly a container terminal, it is utilized also for all types of cargo operations.

As far as highway access is concerned, it is better than most other marine terminals in the port, due to its relative proximity to Interstate 95. Immediate access however, is via narrow congested urban streets.

The Penn Central has direct terminal trackage which is available to all rail carriers for appropriate tariff switching charges. As far as piggy-back operations are concerned, both COFC and TOFC can be handled efficiently.

The 550 acre terminal has sufficient marginal wharf space for six container ship berths as well as 3800 feet for breakbulk ships. A ramp is available for loading and discharging roll on/roll off vessels.

Seven 40 ton mobile gantry container cranes service the six container berths,



DUNDALK MARINE TERMINAL

while four whirley cranes, two 60 ton and two 50 ton, serve optional container and general cargo handling requirements. Five straddle carriers are employed in the container yard operation, basically a stacked system, while yard commandos provide additional on-terminal container yard mobility.

No formal truck gate presently exists, but a gate complex is planned for the near future. Arriving truckers now enter the terminal, clear documentation with the receiving or delivery office, and are routed accordingly. There are presently two truck scales in operation.

Terminal improvement and expansion continues, insuring Dundalk's status as a superior marine terminal.

#### CANTON MARINE TERMINAL

Canton Marine Terminal (CMT) is located about one and one-half miles north of Dundalk Marine Terminal on the Patapsco River, making it easily accessible to vessels entering port.

This public terminal complex of nine piers is administered by three different terminal operators. International Terminal Operators handles the Prudential Grace and Transamerican Trailer Transport operations on pier 11. The Prudential operation is a container/LASH/general cargo combination, while Transamerican operates a roll on/roll off trailer operation.

Highway access to Canton Marine Terminal is acceptable because of its location near Interstate Highway I-95. Immediate access is, however, via worn and narrow roadways.

The terminal is served by the Canton Railroad, which connects with the Penn Central, C&O/B&O, and Western Maryland Railroads.

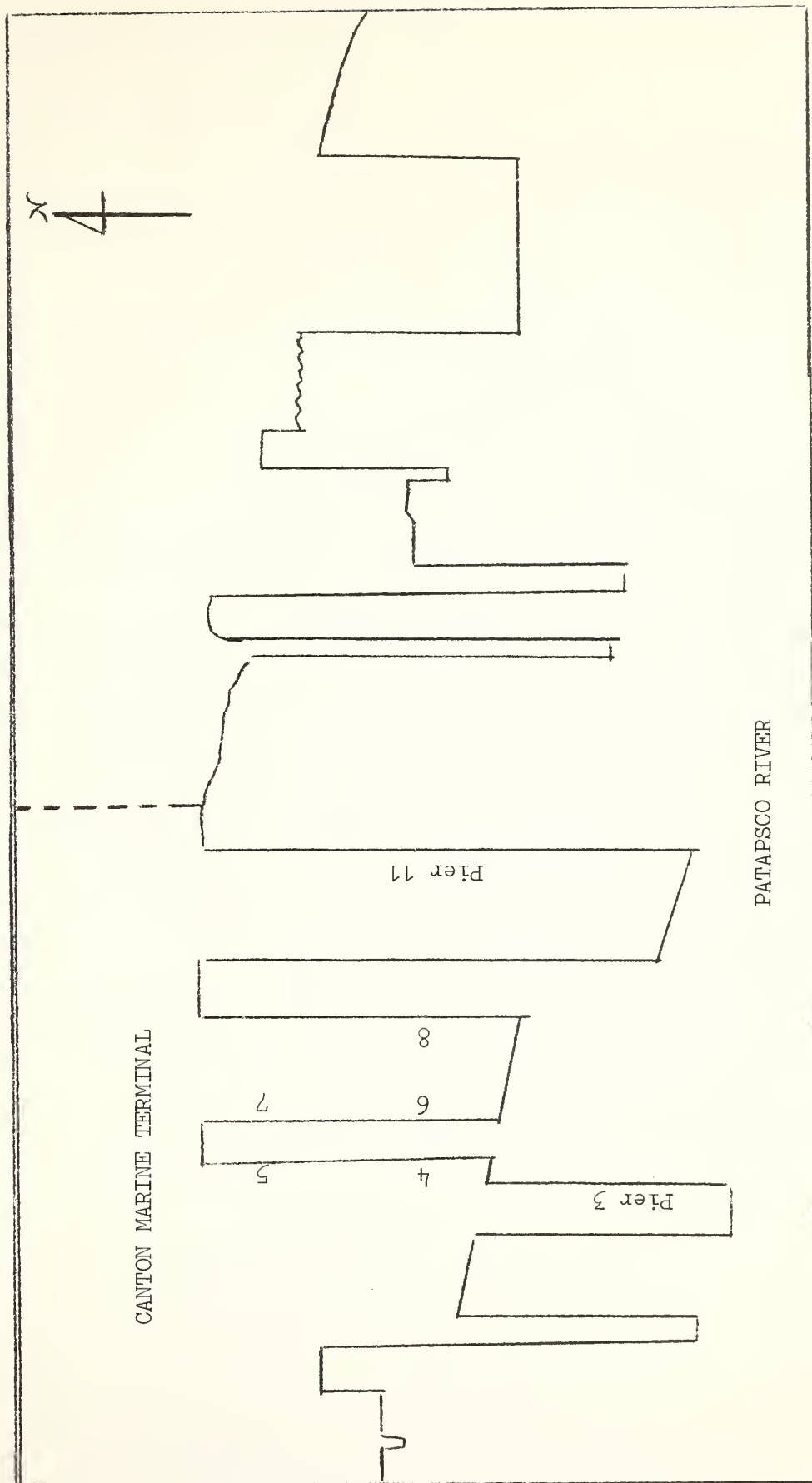
Ten general cargo berths exist with depth of water alongside ranging from 30 to 42 feet. No container cranes are available, however, Prudential Grace vessels are self-sustaining and the Transamerican roll on/roll off vessels require none.

The facility has no formal gate and no such improvement appears to be practical. Truckers arrive, check in with receiving or delivery, and are then routed. No truck scales are present.

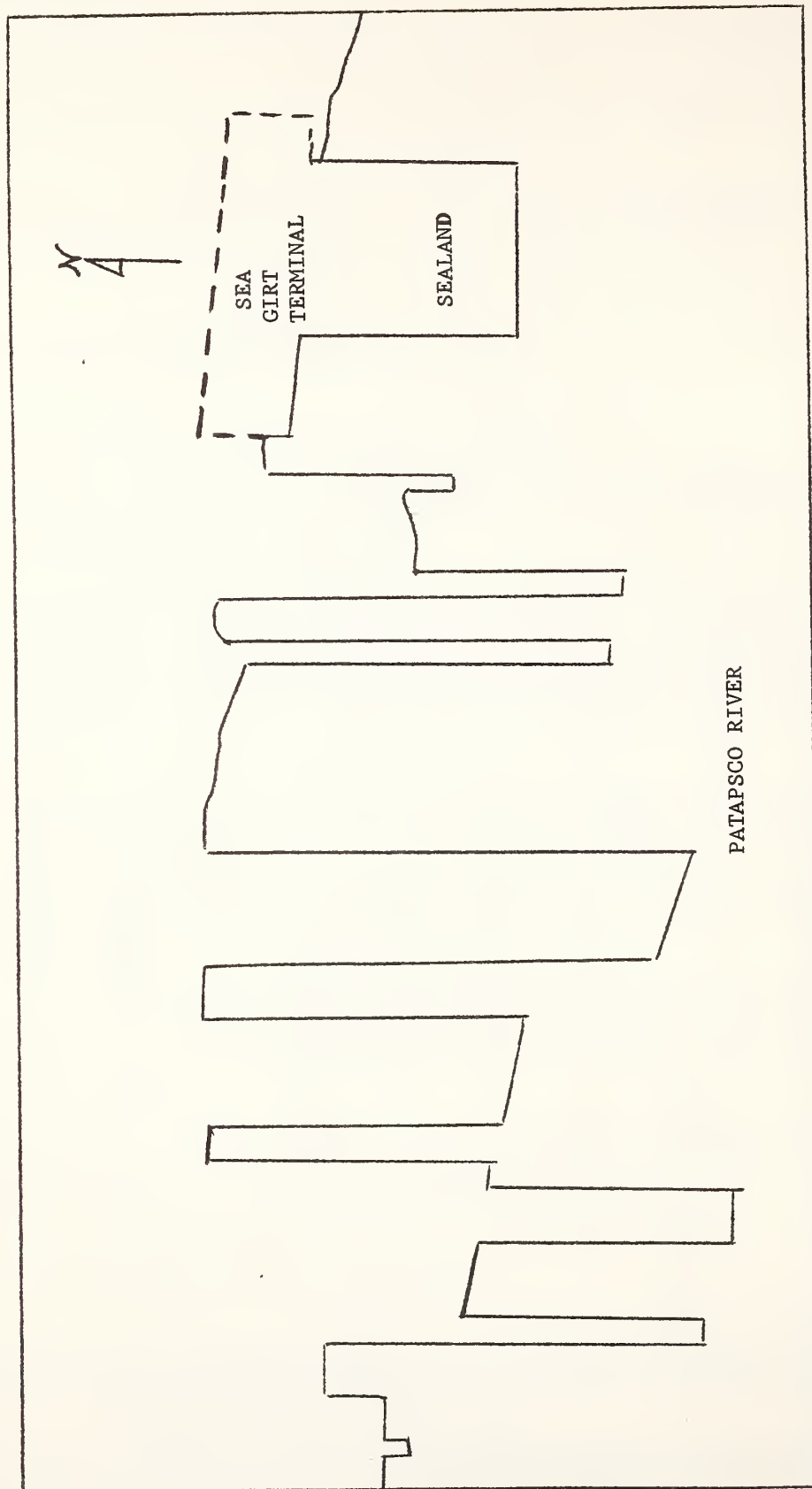
#### SEA GIRT

Sea Girt is the exclusive use terminal of Sea-Land Service. It is located on the Patapsco River between Dundalk and Canton Marine Terminals and provides easy access for arriving vessels.

It was constructed by the Canton Company (which plans further expansion and improvement), as a 17.5 acre site with capacity for 480 containers, and is operated by Sea-Land Service.



CANTON MARINE TERMINAL



SEA GIRT TERMINAL

Highway access is acceptable, but the immediate access roads are old and poorly maintained.

Sea Girt is served by the Canton Railroad which connects with the three major trunk line railroads serving the port.

One 27-½ ton diesel electric container crane serves the 800 foot berth, which is dredged to accommodate 32 foot draft vessels. Because Sea-Land has its usual all-mounted yard system, no container handling equipment other than a number of yard commandos is required.

A two gate complex with a truck weighing station exists where truckers check in prior to presenting documentation to either the receiving or delivery office for proper routing.

#### LOCUST POINT MARINE TERMINAL

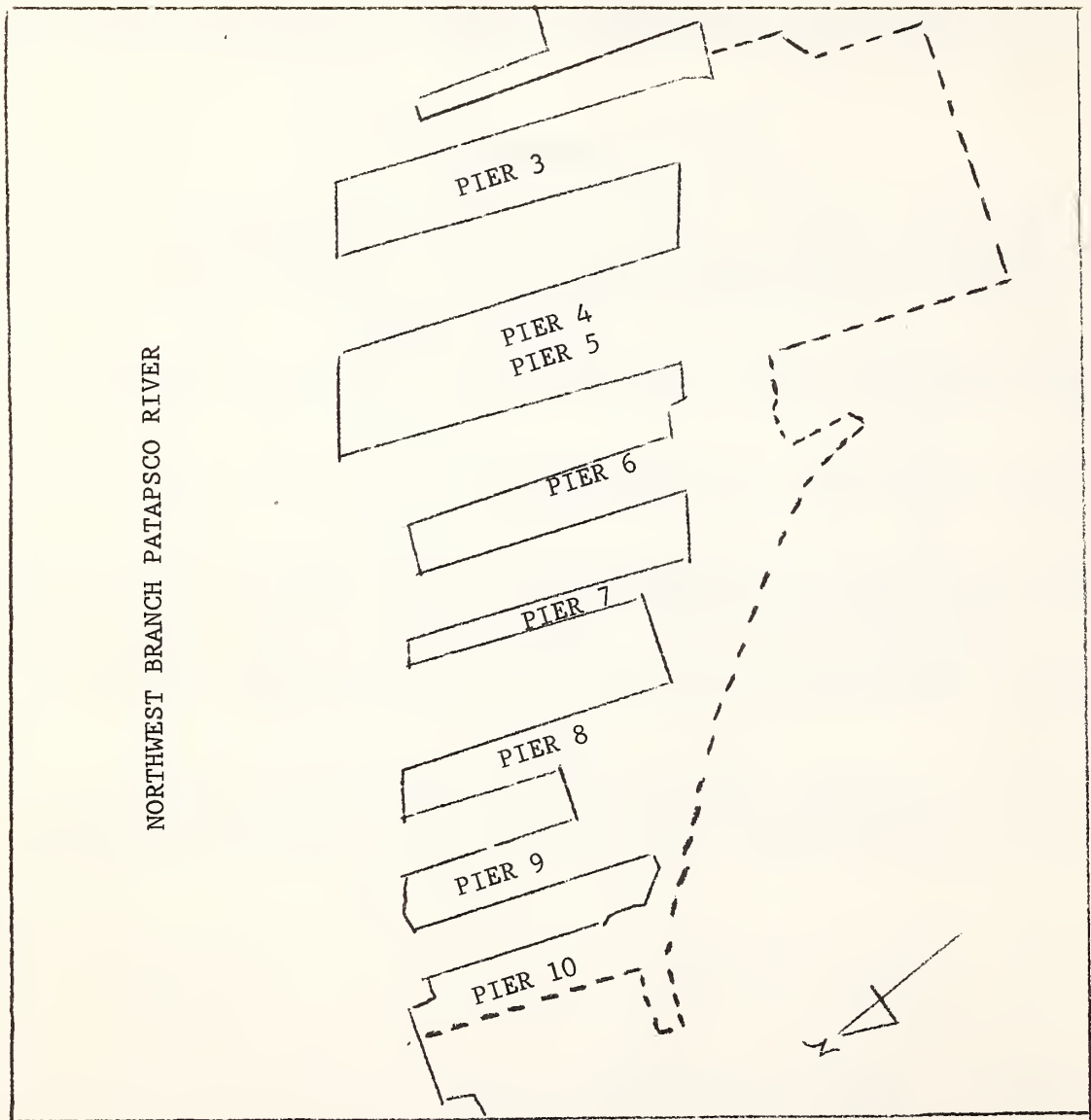
Locust Point Marine Terminal (LPMT) is situated on the west side of what is known as the Inner Harbor and Northwest Branch. The Maryland Port Administration owns this public marine terminal, but the seven pier complex is administered by several different terminal operators.

Although the immediate locale of the facility is urban in nature, highway access is satisfactory.

Locust Point is served by the Chessie System which connects with both the Penn Central and Western Maryland Railroads.

Seven general cargo piers and one bulk cargo pier provide seventeen general cargo and three bulk vessel berths in water ranging from 27 feet to 34 feet. Two 75 ton gantry cranes serve pier 4 and handle both containers and heavy lifts. Yard commandos shift mounted containers within the terminal while mounting or dismounting of containers is accomplished by heavy duty fork lift trucks.

The terminal gate has no special facilities for the receipt/delivery and inspection of containers. Truckers arrive, check in with receiving or delivery and then are routed. The terminal presently has no truck scales.



NORTHWEST BRANCH PATAPSCO RIVER

LOCUST POINT MARINE TERMINAL

## RAIL/MARINE INTERFACE ANALYSIS

An analysis of the rail/marine interface at the Port of Baltimore was made based on the following considerations.

1. Nature of interchange
2. Interchange Procedures
3. Drayage distance, time, and cost factors

Other related aspects of the interface were also covered if they were consistent with the purpose of the report.

The Baltimore Port area chart located at the beginning of this report serves to indicate the relative locations of rail and marine terminals being discussed.

### Nature of Interchange

The transfer of containers between rail and marine modes is accomplished by either drayage or direct marine terminal transfer. Penn Central and the Chessie System apparently prefer direct transfer when practicable. Western Maryland, however, still maintains a heavy drayage operation. Although direct rail trackage exists to all major marine terminals, drayage is often more economical and expedient and is used to one degree or another in the transfer operations of all three rail carriers.

The use of both drayage and direct delivery by rail car as methods of accomplishing rail/marine interchange is attributed to the following factors.

1. The switching charge for the shifting of a railcar onto or adjacent to a marine terminal for direct transfer is, at \$25 per railcar, relatively attractive. However, the loss of immediate control and re-utilization of a railcar for at least several days is a disadvantage, especially in these days of frequent railcar shortages and rapid turn around time requirements for equipment.
2. Drayage is a more flexible and expedient method of transfer. While drayage is more costly, it has the advantage of releasing the railcar and eliminating switching procedures required for direct transfer, frequently over a competitor's trackage.
3. Only Dundalk Marine Terminal, of the four marine terminals, has practical COFC handling capability. This immediately restricts direct marine terminal transfer, as far as COFC is concerned.

Truck traffic generated by railroad movements of containers to complete transfer has little effect on port and marine terminal traffic congestion levels. This is due mainly to the large container handling capability of the marine terminals. In any case, the drayage level has remained somewhat constant due to the growing preference by the railroads for direct marine terminal transfer where possible and economical.

## Interchange Procedures

Interchange between rail and marine terminals, accomplished through drayage by the railroads, follows the normal procedure of unit by unit truck hauls. Documentation processing is almost identical to that for long haul trucker operations.

Direct delivery of containers from railcar to marine terminals is somewhat more involved. Piggyback trains arriving at Baltimore are received at one of the three principal rail terminals described earlier. Piggyback railcars destined for marine terminals are separated and classified for shifting to these destinations. Depending on the marine terminal involved, the railroad either completes the move or interlines with the Canton Railroad or another trunk line railroad serving the terminal directly.

Upon arrival of the cars at the marine terminal, the terminal operator off-loads the container units. The terminal operator acts on behalf of both the railroad and steamship operator at this transfer point.

The following steps ensue:

1. An inspection interchange receipt is completed on the spot.
2. Off-loaded export containers are stacked on the terminal or remain mounted on chassis and parked as appropriate to the nature of the terminal or the requirements of the steamship company.
3. Dock receipts, which have been pre-lodged at the terminal receiving office by a foreign freight forwarder, can then be signed and distributed to the shipper or his agent.

## Drayage Distance, Time, and Cost Factors

Many factors are considered in truck rate making such as equipment depreciation, administrative overhead, operating costs, quality of service, basis of rate application, and extra charges, to name only a few major items. The volume of cargo expected or contracted for, terminal delays anticipated and times and distances between terminals are also important factors.

In the particular case of container drayage between rail and marine terminals in Baltimore, the distances and travel times between the several terminal pairs appear less important than the movement consistency and volume being offered to the trucker. Volume estimates, coupled with established traffic pattern considerations, plus marine terminal procedural time allowances, become the major part of the rate making process.

The average cost per container depends, therefore, on the volume and traffic patterns as well as the other factors mentioned above. Various groups and individuals such as the Maryland Port Administration, regional railroad representatives, local draymen, and steamship operators were consulted regarding truck drayage rates. It is estimated that a range between \$22

and \$26 per container represents the average drayage cost in the port and varies with the volume of cargo or number of hauls being offered.

Free time allowed and truck detention rates appear in varying forms in individual truck tariffs and are part of the quoted rates. Terminal delays exceeding allowable free time are charged to the shipper or consignee. The terminal tariffs in existence make no mention of detention time. As a general practice marine terminals do not honor truck detention claims from consignees, shippers, or trucking companies.

The following two tables show the approximate distance and average transit time between each rail and marine terminal.

DISTANCES AND AVERAGE TRANSIT TIMES  
FOR TRUCK DRAYAGE OF MARINE  
CONTAINERS BETWEEN RAIL AND MARINE  
TERMINALS IN BALTIMORE

DISTANCES  
(Miles)

	BAYVIEW PENN CENTRAL	WICOMICO CHESSIE SYSTEM	PORT COVINGTON WESTERN MARYLAND
DUNDALK MARINE TERMINAL	4	9	10
SEA GIRT MARINE TERMINAL	2	5.5	7.5
CANTON MARINE TERMINAL	1.5	5	7
LOCUST POINT MARINE TERMINAL	6.8	3	3

TRANSIT TIMES  
(Minutes)

	BAYVIEW PENN CENTRAL	WICOMICO CHESSIE SYSTEM	PORT COVINGTON WESTERN MARYLAND
DUNDALK MARINE TERMINAL	25	45	70
SEA GIRT MARINE TERMINAL	20	35	60
CANTON MARINE TERMINAL	20	35	60
LOCUST POINT MARINE TERMINAL	50	20	15

## RECOMMENDATIONS

Considering the present overall efficiency of interchange, no major changes are felt necessary at this time. If a strong trend develops shifting preference from drayage transfer to direct rail delivery to marine terminals, further improvements by means of lessened traffic congestion and marine terminal procedural delays may yet be realized.

The following general recommendations, no doubt applicable to most ports, would increase present efficiency to an even greater degree:

### 1. Receiving and Delivery Procedural Improvement

The continued simplification and standardization of marine terminal receiving and delivery procedures would aid terminal efficiency greatly. Familiarity with a standard portwide procedure would allow a trucker to help expedite the total receiving and delivery operation.

### 2. Documentation Standardization and Simplification

Transportation paperwork as a whole is continuously undergoing change. Uniformity in such documents as delivery orders, weight certificates, interchange inspection forms, etc., would aid more rapid recognition and processing by terminal receiving and delivery offices.

The Office of Ports and Intermodal Systems of the Maritime Administration is taking an active interest in documentation simplification and working with U.S. flag ocean carriers to identify and correct causes of marine terminal delays and congestion. Similar participation by port authorities and terminal operators in such activities would offer additional assistance to ongoing efforts seeking a solution to the paperwork maze.

### 3. Shipper/Consignee Education and Guidance

Steamship companies or agents should educate their customers as to the most efficient means of accomplishing transfer between rail and marine terminals within the port. This would place the customer in a better position to evaluate the relative merits of different rail plans, and allow him to guide his freight forwarder or custom house broker more effectively.

The development of Baltimore as a container port has been impressive. It is hoped that continued monitoring of the rail/marine interchange by port planners will insure that this important facet of intermodalism will favorably contribute to the port's commerce.



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